erected by the bridges and buildings department of the Grand Trunk Railway. The foundations are of concrete.

The boulevard will be carried across the western channel by means of a bascule bridge and will be continued right around the island and over the eastern channel by another bascule bridge and on to the Woodbine along the southern margin of the harbor-terminal district.

Fifty acres have been reclaimed west of Ward's Island, and about twelve acres east of Ward's Island, all of the reclamation work at the Island being on the inner or harbor side. Just east of Blockhouse Bay, 65 acres have been reclaimed and at Toothpick Island a reclaimed section of which is shown in the accompanying sketch. Each block contains about 200 cubic feet of concrete and weighs approximately 15 tons. It is reinforced with  $\frac{3}{4}$ -in. rods placed every twenty inches. Two lifting staples 1 inch in diameter are embedded in the top of the block. The block is moulded on shore and is put in place by a floating derrick. Two drift bolts 1<sup>1</sup>/<sub>4</sub> ins. square by 36 ins. are placed in a recess left between each pair of blocks, which recess is afterwards filled with concrete. These drift bolts extend through the floor and into the 8-in. x 10-in. cap. On top of these concrete block, when in place, is poured a continuous reinforced concrete cap, as shown in the accompanying sketch. The



September 22nd, 1916 Looking East from the Humber River, Showing Reclamation

area has been top-dressed and parked by the Toronto Parks Commissioner. A total of about 200 acres have been reclaimed at Toronto Island.

The improvement of the water front along Toronto Bay has also been started, the work progressing easterly from the western channel. A series of slips or docks will be constructed along the water front as indicated on the accompanying plan. It is intended to build fourteen slips along the north harbor front, extending for a distance of approximately 21/4 miles. These will require the construction of about 88,000 lineal ft. of harbor head walls on cribs, and from six million to eight million cubic yards of fill. This fill will be sand and clay dredged from the harbor. No shoals will be left in the harbor. It will all be either deep water or sloping beach. The easterly terminus of the fourteen slips above mentioned will be at the foot of Parliament Street, near the National Iron Works property. The first section of harbor head wall, about 1,700 ft., was awarded to R. Weddell & Co., of Trenton, Ont., and the second section of 2,300 ft., to John F. Russell, of Toronto. These two firms have completed about 4,000 ft. of the cribs and have placed the concrete block superstructure on about 3,000 ft. The crosssections of these cribs vary from 18 ft. x 18 ft. on the land end to 22 ft. x 22 ft. on the outer end, the harbor faces of the docks being the larger sections and the bulkhead faces of the docks being the smaller sections, the slip faces gradually increasing in size of section as they extend out from the bulk-head wall. These cribs are made up of 10-in. x 10-in. timbers, bolted together and filled with heavy stone. The cribs are floored with 4-in. plank spiked with 8-in. spikes to an 8-in. x 10-in. timber cap. On this floor rest moulded concrete blocks, crossmass concrete carries a 12-in. x 12-in. wale streak along its face, supported by angle irons which are bolted to the concrete. The reinforcing consists of  $\frac{3}{4}$ -in. diameter by 11-ft. long rods, placed every two feet. The portion of the mass concrete resting on each block weighs about 5 tons.

The bill of material for 100 lineal feet of concrete superstructure includes two 4-in. x 4-in. x 3/8-in. angles, 9.8 lbs. to the ft.; forty 6-in. x 8-in. x 3%-in. plates, 5.1 lbs. to the ft.; and 12 lbs. of rivets; making a total of 2,176 lbs. of structural steel. Also 400 spikes, 120 bolts, 20 drift bolts and 40 cast-iron washers, making a total of 832 lbs.; 40 pieces of 4-in. x 10-in. planking, 12-ft. long; and one 12-in. x 12-in. waling streak. Also one hundred and ten 3/4-in. bars, 11 ft. long, weighing 1.5 lbs. per ft.; eight 34-in. bars, 100 ft. long, weighing 1.5 lbs. per ft.; one 11/2-in. bar, 100 ft. long, weighing 6.008 lbs. per ft.; and eighty 1-in. bars, 5 ft. long, weighing 2.67 lbs. per ft.; or a total of 4,684 lbs. of reinforcing steel, all round bars. The 100 ft. of concrete superstructure of which this is the bill of material, contains 3,825 cu. ft. of block and 1,484.4 cu. ft. of mass concrete, so that per running foot the superstructure of the wall will contain approximately 1.42 cubic yards of block and .55 cubic yards of mass concrete, or a total of approximately 2 cubic yards of concrete per running foot.

All of these cribs in the inner harbor will be toe-pinned to rock, on the outer or harbor side, with 3-in. lug pins, to prevent buckling when back-filled and surcharged.

The Don diversion has been completed, as has also the northern slip which extends from Cherry Street to the Don River, and which affords 4,500 ft. of dockage along the northwestern corner of the harbor-terminal district.